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VOL. XX AIR CORPS NEWS LETTER NO. 23.

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The chief purpose of this publication is to distribute information on aeronautics to the flying personnel in the Regular Army, Reserve Corps, National Guard, and others connected with aviation.

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PRESENTATION OF THE COLOMBIAN AND LUKE MEMORIAL TROPHIES

By Private Harvey N. Finger

IN a very impressive ceremony, before the assembled 3rd Attack and 20th Pursuit Groups and some fifteen thousand spectators, Major General Frank M. Andrews, Commanding General of the GHQ Air Force, presented the Colombian and Luke Memorial Trophies to the 3rd Attack Group and the 77th Pursuit Squadron, respectively.

The presentation took place at Barksdale Field, La., on Sunday afternoon, November 21, 1937, and was without doubt the most outstanding event since the dedication of the field. The event had been given wide publicity and was anticipated for weeks by the citizens of the Ark-La-Tex area.

In presenting the Colombian Trophy, General Andrews said:

"The Third Attack Group is the winner of the Colombian Trophy for the second consecutive year. Let me remind you that this beautiful trophy, handwrought in pure silver, was presented to the GHQ Air Force by a representative of the Air Force of the Republic of Colombia in order to cement more firmly the spirit of friendship between the two American Republics, and to express the feeling of comradeship which exists among fliers of all nations.

"Each year this trophy is awarded to the group of the GHQ Air Force which has the lowest accident rate per thousand flying hours for the preceding training year. During the past year, the Third Attack Group had but four minor accidents out of a total flying time of over 23,000 hours. Only one injury was sustained, and that was minor in nature. This excellent record was approached by only one other group - the 8th Pursuit - which had a total of six minor accidents. I regret to state that all other groups had at least one fatal accident.

"However, it is very gratifying to note that the accident rate in 1937 for the entire GHQ Air Force was just about one-third less than it was for 1936. This indicates that accidents can be reduced if sensible policies are intelligently and energetically carried out by tactical units. And so, every one of us can rightly share a feeling of pride over a task well done.

"I feel that no small measure of credit is due to the Colombian Trophy, which serves not only as an added incentive to officers and men of the combat units, but which helps to make all of us conscious of the extreme care which must be exercised in every phase of supervision, maintenance, and operation of aircraft. Supervisory personnel, the pilots themselves, and every enlisted man who performs some task having to do with the operation and maintenance of the airplane and its equipment - all have a joint responsibility in the matter of accident prevention.

"I think it is well to point out that each succeeding year, with the closer airdrome control of modern operations, sees the growing responsibility of supervisory personnel. Therefore, the award of this trophy to the Third Attack Group indicates not only a high order of efficiency of its former commander, Lieut. Colonel Earl L. Naiden, and of every officer and enlisted man in that Group but also reflects credit on the Third Wing and the Sixth Air Base."

Colonel Era A. Rader, present commander of the Third Attack Group, stepped forward and received the trophy from General Andrews.

In presenting the Frank Luke Memorial Trophy, General Andrews said:

"The Luke Trophy, a memorial to Lieut. Frank Luke, Jr., one of the most famous of all our American Pursuit pilots in the World War, is awarded annually to the Pursuit squadron making the highest average gunnery score in record practice during the training year.

"The Frank Luke, Jr. Memorial Trophy was originally presented by the Arizona Department of the American Legion in 1932. I regret that a representative of that patriotic body is unable to be here to make this presentation. The Department Adjutant, Mr. E.P. McDowell, desires me to extend his congratulations to the winner this year and to express to you the hope that this Trophy will provide an incentive for the continual betterment of the service.

"The 77th Pursuit Squadron, by the very excellent record of 58 percent possible hits for its entire record practice during the past year, is the winner of the Luke Trophy. I desire to extend my con-

gratulations and appreciation to the Commanding Officer, Major Clark; the former Commanding Officer, Major Carlton F. Bond, and the individual officers who made this excellent showing. You have a record for the past year of which you may be justly proud."

Both the speech by General Andrews and the introductory speech by General Frederick L. Martin, Commanding the Third Wing, GHQ Air Force, were broadcast to the assembled multitude through a public address system installed for the occasion. Following the presentation ceremonies, the airplanes of the Third Wing passed in review for General Andrews.

The rest of the afternoon was given over to Barksdale Field's fourth annual tactical demonstration. The various units and individuals who participated in the program performed superbly, and there was naught but praise for them from the spectators.

The curtain raiser for the demonstration was a formation of eighteen Pursuit airplanes conducting mass firing at ground targets. These planes were led by Major Carlton F. Bond, and were immediately followed by Lieuts. Park R. Learned and Cecil P. Lessig, who thrilled the crowd with their excellent exhibition of "dog-fighting."

Lieuts. Wilbur D. Camp, James Ferguson and Loring F. Stetson were next in line, and after they started with a bursting bomb, they proceeded to put their tiny Pursuit ships through the paces. While the "Pea Shooters" were doing the flying during the early part of the program, the Attack Group was busily loading their airplanes with bombs and machine gun ammunition, and after taking the air the following events came in rapid succession:

Dropping of parachute bombs by the 8th Attack Squadron from A-18 airplanes; bombing attack on ground targets by the 90th, using 100-pound bombs, and dropping of fragmentation bombs by the 13th Attack Squadron. After their bombing attacks, the three squadrons of the Attack Group rendezvoused and conducted a mass machine gun attack on targets which had been erected on the east edge of the flying field.

Again it was the Pursuit Group's time to take the air, and they were represented in the next event by Lieuts. Troy Keith and Lamont Saxton, who bursted balloons and cut streamers with deadly accuracy. Parachute jumps were next in order, and the huge crowd was indeed thrilled as four enlisted men of the 6th Air Base Squadron floated earthward beneath their billowy canopies of white silk.

The comparison between new and obsolescent equipment was demonstrated when three B-5A Bombers, flying in formation, were rapidly overtaken and passed by a B-17 Bomber.

The program was completed by three airplanes from the 90th Attack Squadron laying a smoke screen the length of the flying field.

The precision with which the program was conducted, the excellent advance publicity that had been given both the presentation ceremonies and tactical demonstrations, the expeditious manner in which traffic was handled and the general success of the entire day was due to the personal supervision of both General Martin and Colonel Goolrick. The special staff they appointed to take care of the detailed arrangements was as follows:

Colonel Ira A. Rader, Commanding Officer of the tactical demonstration.

Lieut. Colonel William C. Ocker, in charge of traffic and general handling of the crowd.

Major Frank L. Cook, in charge of all ground arrangements.

Lieut. Arthur F. Merewether, in charge of publicity.

Lieut. Kermit D. Stevens, announcer for the public address system.

The Colombian Trophy has an interesting history. In 1935, during the concentration of the GHQ Air Force at Miami, Florida, for tactical exercises, Major Benjamin Mendez, a member of the Air Force of the Colombian Republic, presented the Trophy to General Andrews. It was subsequently accepted by the United States Government through diplomatic channels.

The Third Attack Group became the first custodian of the Trophy by virtue of having had only two accidents in a flying time of 9,193 hours, a rate of .218 per thousand hours. This was for the year 1936.

Prime reason for the existence of Pursuit airplanes in the GHQ Air Force is to attack enemy airplanes with machine guns in case of war. To encourage the men who fire these machine guns to their best efforts, the Arizona Department of the American Legion, on December 17, 1932, donated to the War Department a bronze plaque in memory of Lieut. Frank Luke, World War hero and a native of Phoenix, Arizona, whose valorous deeds in the World War won for him the posthumous award of the Congressional Medal of Honor. He was one of the outstanding American flyers in the great conflict, bringing down eighteen enemy aircraft before he too perished in sky combat. He was known in the Aviation Section, Signal Corps, as the "Balloon Buster" of the A.E.F., because of his deadly accuracy in downing the observation "sausages" of the Germans.

Originally the Trophy was to be awarded to the West Coast Pursuit pilot having the highest score in his annual gunnery record firing, but in the year 1936, in

view of the fact that no Pursuit organizations were stationed on the West Coast, the conditions of the award were changed so that the presentation would be made to the organization having the highest aggregate score, said organization to be a Pursuit Squadron of the GHQ Air Force.

The first award of the Frank Luke Trophy in 1933 was made to 2nd Lieut. W.C. Morse, of the 95th Pursuit Squadron, March Field, Calif., who in record firing attained 1014 points out of a possible score of 1750, a percentage of accuracy of 57.9.

The Trophy was not awarded in 1934, due to uncompleted gunnery season.

Second Lieut. Frederic C. Gray, Jr., Air Reserve, received the 1935 award for the best aerial Pursuit gunnery performance of the year, his record being 1176 points out of a possible score of 1750, his percentage of accuracy being 60.7.

The 79th Pursuit Squadron, GHQ Air Force, received the 1936 award for the highest aggregate score in aerial gunnery, the average score being 59.5%.

Additional details supplied by the News Letter Correspondent of the 20th Pursuit Group, relative to the activities at Barksdale Field on November 21st, are given below, as follows:

The thousands of spectators were first thrilled with an aerial review by the entire Third Wing. Following the review, the 20th Pursuit Group "peeled off" and gave a demonstration of mass gunnery on ground targets that was excellent. Three flights of six planes each were used, the flights being made up of three 2-ship elements.

As the Group circled for landing, two P-26A's came screaming out of the stratosphere to give a demonstration of an aerial "dog fight." They left no stones unturned. The crowd was still "oh-ing" and "ah-ing" when three more "pea shooters" came hurtling down to the hangar line and pulled up into a bursting bomb. Their antics kept all the visitors on their toes for the next ten minutes. The trio ended their part of the show by flying down the hangar line on their sides.

Following the Pursuit Show, the Attack Group took off and put on a wonderful exhibition of bombing and shooting at ground targets. One of the highlights of the show was the dropping of dummy parachute bombs by the 8th Attack Squadron which is now equipped with the new Curtiss A-18 Attack planes.

Although the temperature hovered around thirty degrees all afternoon, a tremendous crowd from all the Ark-La-Tex area witnessed this aerial spectacle. The proceeds of the nominal admission charge were given to local charitable institutions.

ATTACKERS COOPERATE WITH GROUND TROOPS

Nineteen Attack airplanes from the 3rd Wing, GHQ Air Force, Barksdale Field, La., arrived at Kelly Field, Texas, on November 7th, under the command of Major P.L. Williams, and took off the next day for Camp Bullis, where the airmen carried out a training mission in connection with the test division in the field at that locality. The flight returned to Barksdale Field upon the completion of the mission.

On the afternoon of November 8th, another flight of 19 Attack planes, under the command of Major A.C. Strickland, arrived from Barksdale Field to carry out a similar mission. The Army flyers took off the following morning for Camp Bullis to swoop to the attack of columns on the march, the mission being to attack with whitewash "gas" as well as simulated machine gun strafing. Their mission completed, the flight returned to Barksdale Field on November 10th.

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EXPERIMENTAL INSTRUMENT FLIGHT

The 37th Attack Squadron, Langley Field, Va., on November 5th, conducted a more or less experimental instrument flight, when the pilots of three airplanes flying under the hood at two, four and six thousand feet altitude, respectively, were directed to Middletown, Pa., by radio control from a fourth airplane which performed the navigating and directing. The experiment proved very successful. During the first five minutes of the flight, however, while the pilots were getting orientated on their courses, the directing pilot found himself as busy as a telephone operator in the New York Stock Exchange in his endeavor to keep the instrument pilots within reasonable distances of each other. After the first twenty minutes, there were no more than ten orders given over the radio for one hour to keep the airplanes all intact on into Middletown.

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Roaring eastward from California in the closing days of October, five B-18's finally arrived at Mitchel Field, N.Y., for assignment to the 18th Reconnaissance Squadron. These, with the Sikorsky S-43, soon to arrive from Bridgeport, will provide the Squadron with equipment adequate to perform the duties of search and patrol for B-10 or B-18 Bombardment units to which it may be attached. The ferry teams were Major Melville, newly joined Squadron Commander, and Lieut. Hollstein; Captain White and Lieut. Dilley; Capts. Doyle and J.N. Jones, from the 18th; and from the 9th Bombardment Group, Major Connell and Lieut. Baylor in one ship, and Captain Russ Scott and Lieut. Hutchinson in the other.

VARIED PROGRAM FOR TACTICAL SCHOOL STUDENTS

Students of the 1937-1938 Class at the Air Corps Tactical School, Maxwell Field, Ala., had considerable variety introduced into their program during the month of October. While not all of the variety was enjoyed, it served to break the monotony of steady classes and study, and the class is well set for the hard pull to the Christmas holidays.

The annual visits to the Valparaiso Bombing and Gunnery Base were marred by very unseasonable weather. The first section of the class flew down on October 14th for two days of machine gun firing, and a chilly north wind followed closely on the tail of the formations. Due to the shortness of the stay, the students were housed in tents at the flying field instead of being quartered in the cottages at White Point. The unseasonable weather caught the Valparaiso Detachment unawares, and no stoves had been installed in the tents. However, bales of blankets were broken, and most of the students managed to keep fairly warm, although the weight under which they slept left most of them tired the following morning.

The gunnery program was run off under the direction of Captains James E.Parker and Ralph F. Stearley, and consisted of fixed and flexible gun firing at both ground and towed targets. The program was completed on Saturday afternoon, October 16th, and practically none of the students wasted any time in making a fast return to their heated quarters at Maxwell Field. The following week end was almost a duplication of the first, and "B" Section had full reason to be skeptical that there was any such thing as "Sunny Florida." The tent stoves which had been installed by this time came in for full use during the two-day stay.

The Class had two very instructive visits to Fort Benning, Ga., for demonstrations at the Infantry School. On October 19th, they were given a realistic picture of the Infantry Company in its attack, and this was followed in the afternoon by a demonstration of the various Infantry weapons. The accuracy and rapidity of fire of the howitzer and 37 mm. guns were especially impressive. The next visit on November 2nd gave the students an opportunity to see the full Infantry Battalion in a coordinated attack, and as the Infantry map problem on this same subject had been conducted the previous afternoon, it undoubtedly served better than a "school solution" to show the proper tactics which should have been employed.

The final fall visit of the Class to Fort Benning, scheduled for November 16th, was for the purpose of affording the students an opportunity of witnessing a demonstration of what may be expected in artillery fire from the Division Artillery.

During the week of November 1st, the classroom instruction in the Air Navigation Course was brought to a close with several very instructive lectures by Lieut. Thomas L. Thurlow from the Materiel Division.

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INFANTRY CLASS VISITS TACTICAL SCHOOL

The new Refresher Class at the Infantry School, Fort Benning, Ga., paid a visit to Maxwell Field, Ala., on November 5th, in order to obtain an idea as to what makes the wheels go round at the Air Corps Tactical School. The visiting party consisted of the 17 students of the Refresher Class and 23 instructors of the Infantry School, headed by Col. Charles F. Thompson, Infantry, Assistant Commandant.

All but six of the visitors made the round trip by air, Maxwell Field airplanes going over early in the morning to ferry the visitors to the Air Corps station and, following the completion of the program, student officers made the return flight.

The program for the visitors started with a general introduction party in the Office of the Commandant, Brigadier General H.C. Pratt, and then a visit through the school building, conducted by the Assistant Commandant, Colonel Herbert A. Dargue. Captain J. Gordon Pratt, Photographic Officer, followed with a twenty-minute illustrated talk on the latest developments in Photography, and the remainder of the morning was spent on the flying line inspecting the newer airplanes and the functioning of the Operations Office.

At noon the visitors were guests of General Pratt for lunch at the Officers' Club, and then were present at the Operations tower to witness the take-off of the students scheduled for flying. The Air Corps Supply, Engineering Department and Armament Section were visited and the functions thereof explained. The final item on the program was a visit to the Naval Operations Game Room. Lieut. Commander Miles R. Browning, U.S. Navy instructor at the School, showed a very comprehensive layout of various fleet formations, and in his talk thoroughly described the reasons for the various formations.

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Squadron Leader H.B. Seekamp, of the Australian Air Force, was a visitor at Wright Field, Ohio, on November 2nd. The Australian airman was enroute to England, and on his crossing of the United States was planning to visit many aircraft manufacturing plants and government bases.

THE ARMY WAR COLLEGE

By Colonel B. Q. Jones, Air Corps

THE course at the Army War College is the last opportunity for officers to "lose their corners" in the democratizing process of our military educational system. I say democratizing, for there is probably no other environment with as wholesale an atmosphere so true to the American ideas of democracy nor so insistent upon honesty and fair play as our military organization.

The junior schools in the echelons of officer training must perforce instruct by indoctrinization. It is there that the "trade of soldiering" and the "profession of command and staff" are taught. The trades and professions are fairly exact sciences. They are the codifications of the experiences, practices and procedures that have been developed to stabilized status through the ages. Quite naturally those institutions cannot allow unlicensed latitude and freedom of thought by student bodies sent there to be grounded in the very facts of history and experience.

At the Army War College is taught (more properly speaking, self-taught by the students themselves) the "art of war" and the "policies of nations." The art of war and the policies of nations are not exact sciences and are not subject to codification. There are certain immutable principles applicable to the art of war, the violation of which in the face of an able opponent leads to disaster. However, nothing short of natural ability (of which honesty and strength of character are the foundation) coupled with experience, study and reflection can master the art of war. The policies of nations spring from the lives, commerce and politics of peoples. To the average officer they are the mysterious forces that start and stop wars and dictate the manner in which they shall be conducted.

It is the objective of the Army War College to consolidate the previous training, study and experience of the student officers and project their thoughts into the higher War Department and GHQ aspects of war.

As prescribed by the War Department, the mission of the War College is:

> "To train officers for the conduct of field operations of the Army and higher echelons; and to instruct in those political, economic, and social matters which influence the conduct of war."
>
> "To instruct officers in War Department General Staff duties and those of the Office of the Assistant Secretary of War."
>
> "To train officers for joint operations of the Army and Navy."
>
> "To instruct officers in the strategy, tactics, and logistics of large operations in past wars, with special reference to the World War."

The course lasts for ten months, from the first of September until graduation at the end of June. It is divided into two general sections, the first dealing with the preparation for war, the second with the conduct of war. In the first section of the course operations by armies and groups of armies are studied together with the general organization and functioning of the War Department, including the duties, functions and responsibilities and methods of operating of the Chief of Staff, the G-1, G-2, G-3, G-4, and War Plans Divisions of the War Department General Staff, the Office of the Assistant Secretary of War, and the Offices of the War Department Special Staff. The second section of the instruction deals with the conduct of war, wherein students are assigned war subjects and required to prepare plans for, and actually carry on the execution of war missions through the process of group studies, map problems, map maneuvers, and terrain studies. The 88 Army and 4 Naval and 2 Marine Corps officers comprising the student body are organized into command groups for instruction in the conduct of war, and into committees for instruction in the preparation for war. The committees will range from 8 to 12 and 16 members each, wherein especially assigned subjects are researched, analyzed and "synthesized." Each course lasts approximately three weeks, with a fourth week to ten days devoted to presentations and conferences.

Not to neglect the physical well being of the students, an extra half hour is prescribed during the lunch hour in which the students are required to devote themselves to some form of athletics. The most popular sport is soft ball during clement weather. Such games as golf, tennis, handball, squash, volley-ball, badminton, ping-pong and bowling are all played.

What the student officer gets out of the War College is a measure of his own individual capacity. At the Army War College student officers really have the "giftie gie them to see themselves as others see them." By the process of critical self-analysis student officers can get the measure of their own capacities for high command and staff assignments.

The student body itself is composed of some of the ablest officers in the service. A cross section of their experience offers an imposing spread of knowledge and talent. They represent the accumulative knowledge and abilities of a body of professional military students

in the prime of life, stable, honest and possessing a keen capacity for critical analysis of any subject offered for their consideration. The greatest latitude is accorded them in the prosecution of their studies. The forum procedure is followed. No better words describe the "scheme of instruction" at the War College than those used by Mr. Newton D. Baker, when Secretary of War, when he stated that the aim of the War College was "not that some more wise should teach some less wise, but rather that a group of men by contact, consultation and conference evolve the best wisdom of the entire group." In other words, the Army War College is a college in the true sense of the word. It is an open, frank interchange of experience and ideas on the common ground of professional equity for the purpose of the instruction of the whole in the art of war.

Each committee researches an especially assigned subject in each of the courses pursued. The several committee studies are presented by designated speakers in open conference before the whole War College so that all may benefit from the special studies of all committees. In this manner some eighty odd military subjects are studied and discussed during the course of the college year. If no other impression is made upon the student body than that the subjects studied during the college year constitute but a small portion of all the subjects with which the military student should become familiar, then the course at the War College will have proved worthwhile.

The War College is no exception to the mission of all centers of instruction. It can but indicate to its student bodies the nature of the problems peculiar to its specialized field of endeavor and suggest the roads to follow in the pursuit of further knowledge and indicate the doors to open for the solution of special problems.

A student coming to the Army War College should realize that he will travel in fast company and that both he and his ability will be quickly appraised and labeled by his fellow students. It will be through association with his fellow students that he will learn the most, establish his reputation and start those contacts which can go a long way towards making pleasant official relations in his future assignments. It will be in the student committee rooms that close associations will be established and intimate professional experiences and ideas exchanged. It is a good rule for students who expect to come to the War College to come with an open and tolerant frame of mind.

If Air Corps officers coming to the War College as students will appreciate the view of the average ground officer, and if they will realize that it is the self-taught process of instruction that prevails here at The War College, they will be able to render the greatest service to themselves and to their fellow students. It is the exchange of knowledge and experience among the student body at the War College, coming as they do from all branches of the Army as well as from the Navy and the Marine Corps, that comprises so much of the instruction at the War College.

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THE 2ND STAFF SQUADRON AT BOLLING FIELD

The Second Staff Squadron was organized on September 1, 1936, along with the First Staff Squadron and the Base Headquarters and 14th Air Base Squadron, with permanent station at Bolling Field, D.C. The Squadron is under the direct supervision of the Chief of the Air Corps and has no connection with the GHQ Air Force.

When organized, the Squadron was under the command of Captain D.D. FitzGerald who, upon his appointment to the grade of Major in October, 1936, was relieved from command of the Squadron and his place was taken by Captain Arthur L. Bump, Jr., who is in command of the Squadron at the present writing. The officers in the Squadron at the time of its organization included Captain H.K. Baisley, Lieuts. R.E. Koon and J.W. Persons. Captain Baisley was subsequently transferred to the 14th Air Base Squadron and Lieut. Koon to Langley Field, Va. Captain Bump and Lieut. Persons now remain with the Squadron.

When organized, the strength of the Squadron was set at 100 men, but this number has been gradually cut down until now it numbers only 70 men. The First Sergeant of the organization is John J. McStay, who has held this position since the Squadron was organized. The Line Chief is Master Sergeant Hukill, and Technical Sergeants Craft and Roberts are co-workers in charge of the hangar.

At present the airplanes assigned to this Squadron are: 1 PT-3A, 2 P-12E's, 10 O-38B's, 2 A-11's, 1 C-23, 5 BT-9B's, 1 O-46A, 3 A-17's and 1 A-17A.

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Four Air Corps officers, Captains D.B. Phillips, Randolph Field; H.P. Rush, Chanute Field; Lieuts. W.C. Dolan, Brooks Field, and D.O. Darrow, March Field, reported on November 8th for the most recent of the present series of classes being conducted at the Materiel Division, Wright Field, Ohio, for instruction in instrument landing training.

The instruction includes thorough ground training on the Air Corps Link trainer set up in the equipment laboratory, as well as actual flight training in blind instrument landings under the standard Air Corps instrument landing system.

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THE NEW AIR CORPS WEATHER SCHOOL

WITH the advent of the modern long-range aircraft of large size and high landing speeds, which characteristics tend to increase the complications of emergency landings, accurate and efficient weather service has become an absolute essential to safety.

Alive to this need, the War Department instituted the new Air Corps Weather Service, which will eventually provide each Army flying field with its own weather station. At certain of the larger flying fields, such stations will be designated as Air Corps base weather stations, with uninterrupted service throughout the 24 hours of the day.

The impracticability of the immediate procurement of an adequate number of weather forecasters for this service suggested the inauguration of a Weather School under Air Corps supervision, located at an Air Corps field, and to be known as the Air Corps Weather School. Prior to the inauguration of this School, the only source of trained weather personnel was the small Meteorological School operated by the Signal Corps, U.S. Army, at Fort Monmouth, N.J., the capacity of which was but twenty graduates a year.

The new School was established with the experienced teaching staff and equipment of the Fort Monmouth School. Patterson Field, Fairfield, Ohio, was selected as the most advantageous location for it. The excellent organization work, performed in quick order by Captain Don McNeal, Signal Corps, and his assistants, in the transfer of personnel and equipment from Fort Monmouth to the new School, the only one of its kind in the United States for the training of military men, enabled it to be opened for instruction activities on September 1st, with an enrollment of 25 students.

The whole floor of the Headquarters building at Patterson Field was turned over by Lieut. Colonel J.H. Houghton, Air Corps, Commandant of the School, for school purposes. Class rooms, study rooms, laboratories and offices are modern, well lighted, and adaptable to the aims of the School. The desks, specially designed by Captain McNeal, serve the students not only for study purposes but, by the attachment of removable brackets, as small laboratories where weather maps and charts may be mounted on swinging panels about the student, enabling him to study in historical sequence previous weather maps and auxiliary chart data as he works out a map on his desk. These brackets not only hold the maps and charts for his convenience in study, but form small walls, shutting him away from distraction as he works.

For the purpose of developing and translating into practical form this science of weather, a high type of student is required, one who is at least a high school graduate with a college entrance course to his credit. His bent must be along scientific lines. He is chosen from the enlisted personnel and must pass an entrance examination.

A visit to the School will quickly convince one that there are attractions to "weather" other than sunshine and balmy breezes. The faces of the students are eager as they work.

The morning sessions at the School are devoted to Mathematics, including algebra and some trigonometry, physics and meteorology, embracing the modern theory of air mass analysis and the structure of atmospheric formations based upon the polar front theory. The afternoons are given over to laboratory exercises in weather map making, analyzing and forecasting. A study hour following the morning period sometimes turns into a question and answer session and sometimes into a discussion or semi-lecture period revolving about some such subject as the origin and development of cyclones.

Captain McNeal, Assistant Commandant and Senior Instructor of the School, has as aids two assistant instructors and three laboratory directors.

Since each base weather station operating continuously will require for all shifts the services of four forecasters, and each auxiliary station two or three, depending upon its size and location, there will be a demand for capable graduates of the Weather School for some years to come. The course at the School extends over a period of five months, and there will be two classes each year.

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LEGISLATORS INSPECT HAWAIIAN DEFENSES

The month of October witnessed the arrival of a number of members of Congress, who visited Hawaii as members of a Committee on Statehood and of a Sub-Committee of the House Military Affairs Committee. All were interested in the defense forces of the Islands, and a number of inspections and reviews were scheduled for their benefit. On October 11th, the 5th Composite Group landed at Hickam Field and lined up on the completed portion of the mat with full combat crews. The Group was inspected by members of the Committee, accompanied by the Department Commander, Major General Andrew Moses; Brigadier General Barton K. Yount, Wing Commander, and other high ranking officers. On October 14th, the Committee was honored by a review of the Hawaiian Division and the 18th Wing. Ground elements of the 5th Composite Group were moved to Schofield Barracks by truck where, in comparison with crack units of the Division, a very creditable

(Continued on Page 8).

MORE FLIGHT SURGEONS FOR THE SERVICE

Eleven medical officers, who have been taking the basic course at the School of Aviation Medicine, Randolph Field, Texas, since July 15, 1937, graduated on November 13th, last, as Flight Surgeons. Five of these officers, who hold commissions in the Medical Corps, U.S. Army, are stationed at various Air Corps Fields. They are Captains John R. Copenhaver, Kelly Field; Burt Held, Barksdale Field; Paul H. Jenkins, Maxwell Field; Frank H. Lane, Langley Field, and Donald D. Flickinger, March Field.

Four of the graduates, members of the Naval establishment, are Lieuts. Thomas L. Allman, Alfred W. Eyer, Lieuts. (jg) James C. Flemming and William C. Fowler.

Captains Frederick Miller, M.C., of the Washington National Guard, Spokane, and Daniel F. Stough, Medical Corps Reserve, of Geary, Okla., joined the class on October 1st for six weeks of practical work, after having completed the correspondence course of this School, and graduated with the class as Flight Surgeons. Major Julio Cesar Aguilera, M.C., Mexican Army, received a certificate of attendance.

Diplomas were presented to the students by Brigadier General James E. Chaney, Commanding General of the Air Corps Training Center. He was accompanied by Colonel A.N. Krogstad, Commandant of the Advanced Flying School, Kelly Field, and Lieut. Colonel John B. Brooks, Commandant of the Primary Flying School, Randolph Field.

A very interesting and inspiring address was delivered to the class by the Rev. Arthur R. McKinstry, Rector of the St. Marks Episcopal Church, San Antonio. Major G.J. McMurry, Chaplain at Randolph Field, delivered the invocation and benediction, and Lieut. Colonel Coleridge L. Beaven, Medical Corps, Acting Commandant of the School of Aviation Medicine, presided.

Two basic courses, each of four months' duration, are conducted annually, starting on July 15th and December 1st of each calendar year. In addition to the resident course, as a year-round activity, the School conducts an extension (correspondence) course in Aviation Medicine, in which there are now 461 nation-wide enrollees. The permanent personnel on duty at the School now comprise seven officers, eight enlisted men and six civilian employees. The commissioned personnel, all Medical Corps officers, are:

Lieut. Colonel Coleridge L. Beaven, Acting Commandant.

Lieut. Colonel Neely C. Mashburn, Acting Assistant Commandant and Director of Department of Psychology.

Major Charles F. Snell and Captain Charles L. Leedham, Director and Assistand Director, respectively, Department of Aviation Medicine.

Major John M. Hargreaves, Director, Department of Ophthalmology and Otology.

Captain Edward J. Kendrick, Director, Department of Neuropsychiatry.

Captain Benj. R. Luscomb, Executive Officer and Secretary.

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WORLD WAR UNIT RENDERED INACTIVE

The 23rd Photo Section, stationed at March Field, Riverside, Calif., since August, 1936, was on October 15th declared inactive by a War Department order.

A World War unit, organized at Madison Barracks, New York, on July 26, 1918, the 23rd Photo Section served overseas until March, 1919. It was demobilized at Camp Devens, Mass., on May 7th, 1919, and, three years later, in June, 1922, was reorganized at Post Field, Fort Sill, Okla. The unit was transferred to March Field in June, 1927, and assigned to the 13th School Group. It was later attached to the 9th Corps Area, and in 1936 it was returned to March Field.

Under the command of Lieut. Paul Hanley, Air Corps, the 23rd Photo Section had just completed a 1,300-square mile project of mosaic photography for the U.S. Geological Survey, covering areas in Oregon, Montana and Idaho. A great deal of the work was accomplished under adverse weather conditions. Lieut. Hanley, with Sergeant Brees and Corporal Woodward, completed their mission in such a manner that they drew high praise from officials of the Geological Survey.

In rendering the organization inactive, ten of the twenty men were transferred to the 38th Reconnaissance Squadron to carry on aerial photography projects, and the remaining men were transferred to the 4th Air Base Squadron to continue laboratory work and ground photography.

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18TH WING HEADQUARTERS AT HICKAM FIELD

Under General Orders of the Headquarters Hawaiian Department, dated October 30, 1937, the transfer of the 18th Wing Headquarters, Air Corps, from Fort Shafter to Hickam Field was directed. The Headquarters 18th Wing, consisting of the Commanding General and his staff, will remain at Fort Shafter on a detached service status. This marks the formal opening of the post and increases activities toward further development of the largest airdrome in the Hawaiian Islands.

First Lieut. Robert W. Warren, Air Corps, assumed command of the post, and has two Quartermaster officers assigned.

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Legislators Inspect Hawaiian Defenses

(Continued from Page 7).

performance as "foot-soldiers" was displayed. The pass-by of the air elements of the 18th Wing concluded an impressive demonstration of the efficiency of the Army's Island forces.

V-7566, A.C.

INSTRUMENT LANDING SCHOOL CONDUCTED AT WRIGHT FIELD

THREE officers and six enlisted men reported at Wright Field, Dayton, Ohio, during the week of October 4th to receive instructions in the Standard Air Corps Instrument Landing System, which opened up new avenues for safety in flying when developed under the direction of Major Albert F. Hegenberger several years ago.

The system has been installed at 17 Air Corps fields, and the purpose of the present classes is to provide instruction in its use to certain pilots and enlisted men in order that they may in turn act as instructors to their own tactical organizations, thereby establishing uniform methods of flying and maintaining the system throughout the Air Corps.

The school is being operated under the direction of Major C.M. Cummings, with Captain G.V. Holloman serving as instructor for the instrument flights and landings. Only the officers, who are, of course, Air Corps pilots, will receive the instrument flight and landing instructions. The instructions to the enlisted men will cover the maintenance and operation of the equipment.

Classes for officers extend over a two-weeks' period, with three officers to a class. Those for enlisted men will extend over a month's period with six men to a class.

Although 17 Air Corps fields have been equipped for instrument landings, six are located in the Philippine Islands, Hawaii and Panama. Representatives of these fields will receive training at some later date. The eleven fields in the continental limits of the United States - Langley, Mitchel, Barksdale, Selfridge, Hamilton, Kelly, March, Chanute, Brooks, Maxwell and Randolph - will each send one officer and one enlisted man to receive the instructions.

Preliminary instructions for the officers taking the course are given in an Air Corps Instrument Flying and Landing Trainer, ground type, which has been in Air Corps use about a year and a half. This trainer consists of a fuselage equipped with wheel control, rudder, complete set of instruments and radio aids. The fuselage is so mounted that it can be rotated in azimuth by means of the rudder, and the wheel or stick controls the bank and dive or climb. An instructor's table is provided where a problem in radio range orientation can be set up on a keying oscillator and amplifier assembly in such a manner that the student can locate the cone of silence or simulate an instrument landing. A recording device records or plots the course flown by the student, thereby permitting the student and instructor to know definitely where the student was flying at all times. Under this hooded cockpit, the student receives the first four hours of his training. He is then ready to attempt the hooded cockpit in actual flight in a tactical airplane and can actually accomplish the feat of blind landing after one or two attempts.

The airplane instruments for instrument flight and landing are improved but basically the same as those used in the original Army system; namely, the radio compass, flight indicator (gyro horizon), turn indicator (directional gyro), sensitive altimeter, air-speed indicator, and marker beacon receptor.

The ground equipment consists of marker beacon projectors and radio compass guiding stations. This equipment is enclosed in trucks, and has undergone considerable improvement in the last several years, especially in connection with antennas. The newer and more effective types are those which have greatly increased the operating range of the equipment. They have been sponsored by Major General J.O. Mauborgne, recently appointed Chief Signal Officer of the Army.

In the training of pilots for instrument landings, experience has proved that the greatest step is taken when the student accomplishes the first blind landing. This involves a certain psychological adjustment in which the human senses are replaced completely with instrument senses. Once this adjustment is accomplished, however, the whole plan resolves itself into a simple and reliable operation in which he soon gains confidence. Before qualifying as having completed the course, the student must accomplish five consecutive blind landings.

A vast step to advance the present Army Landing System was accomplished when, a month ago, by linking the present instruments with the automatic pilot, an airplane was flown and landed automatically; that is, without any human operation of controls whatever. This system, it is anticipated, will when perfected form part of future instrument landing methods.

A list of officers and enlisted personnel attending the present class follows:

Officers: 1st Lieut. John H. Bundy, Kelly Field; 2nd Lieuts. James H.Houston, Barksdale Field, and Lewis L. Mundell, Hamilton Field.

Enlisted Men: Corporal Donald T. O'Connor, 12th Air Base, Kelly Field; Master Sergeant T.J. Kelly, 5th Air Base, Hamilton Field; Staff Sergeant E.A.Sell, 1st Bombardment Squadron, Mitchel Field; Sergeant E.B. Taylor, 6th Air Base, Barksdale Field; Private 1st Class William Bonto, 3rd Air Base, Selfridge Field; and Private 1st Class G.L. Gilliland, 1st Air Base, Langley Field, Virginia.

GUNNERY IN HAWAII WITH B-12's

In carrying out gunnery from B-12 type airplanes recently, the 23rd Bombardment Squadron, Luke Field, T.H., was establishing a precedent for the rest of the 5th Composite Group, as all previous aerial gunnery had been accomplished in Keystone Bombers. To perform gunnery work with the new airplane required a bit of inventive work on the part of the armament section of the Squadron. Since none of the B-12's on Luke Field were equipped with tow reels, a makeshift had to be devised. After many mistakes and lost targets, it was found that the solution was to use ordinary 5/8-inch sash cord, one end of which was fastened by means of an eye to a bomb shackle in the bomb bay, the other end to a 20-foot length of flexible wire cable. The standard tow target release was fastened to the end of the cable in the usual manner. The rope was attached in the bomb bay, strung through the bomb bay doors which were left partly open, and back into the ship through the tunnel gun opening in the rear of the ship. Here the rope was neatly coiled on the floor so that when in the air the man in the rear could let the rope of the tunnel gun door slowly and safely. The targets, which were already attached on the rope by means of rings, were then let out after the rope was entirely out, and operations could then be carried on in the normal manner.

On the last run the entire cable could be released by means of the emergency release which would drop the rope off the bomb shackle. A metal guard was placed over the edge at the rear of the bomb bay to prevent chafing of the rope at this point. The wire cable was necessary because of the abrupt curve in the rope just in front of the weighted release. Before the cable was spliced to the rope, a good many targets and releases were lost because of the new sleeve failing to negotiate the bend and parting the rope just in front of the release. After the above set-up had been made, gunnery went along with only a few unavoidable mishaps.

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AIRPLANE JACKS

A light collapsible tripod airplane jack with a rated capacity of 10,000 pounds has been released by the Materiel Division as Air Corps standard. This type of jack is suitable for use with B-10B, B-18, B-18A, C-32, C-33 and C-34 airplanes. A 5-ton hydraulic commercial jacking unit is used in conjunction with the tripod. By removing three wing nuts the tripod can be folded to an overall dimension of 10 inches by 10 inches by 60 inches. As the weight of the jack is less than 100 pounds, it may be readily transported and operated by one man. This is a considerable improvement over a number of very heavy, screw type jacking units constructed in the past.

A quantity of these jacks is in production at the San Antonio Air Depot and will soon be distributed throughout the service.

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PORTABLE PHOTOGRAPHIC LABORATORY

A Sub-Committee of the Air Corps Technical Committee, convened at the Materiel Division recently for the purpose of making inspection, evaluating design and preparing required military characteristics for a portable photographic laboratory, in order to submit data which would serve the purpose of a service test report on this equipment. Members of the committee were Majors C.Y.Banfill, Office of the Chief of the Air Corps, President; E.B. Bobzien, Logan Field, Baltimore; Donald Stitt, Chanute Field; George W. Goddard, Wright Field; Captain H.K. Baisley, Bolling Field; Lieut. J.F. Thompson, Fort Knox, Ky.; Master Sergeants Gilbert, Chanute Field; A.E.Mates and Sergeant A.E. Pollard.

The meeting of this Sub-Committee should result in materially speeding up the change of status so that equipment can be procured from funds set up on the program for this Fiscal Year.

The portable photographic laboratory available at the Materiel Division for this study and test is the Type A-1, which was fabricated in accordance with Air Corps Specification. It is 18 feet long, and the interior is divided into two apartments, one for developing, the other for printing purposes. All of the necessary processing equipment and facilities required to process completely aerial roll film, cut film, and to produce photographic prints are completely housed within the two separate rooms provided. Water is refrigerated. A 110-volt alternating current generator makes standard plug-in possible.

The complete laboratory unit is built on a chassis which can be towed by Quartermaster vehicles. The processing equipment is specially designed to keep the weight and size down to the minimum. The arrangement of the equipment and rooms permits a regular line production of photographic prints that can completely process and dry two hundred 8 by 10 inch size prints per hour.

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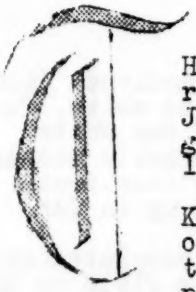
The 20th Bombardment Squadron, Langley Field, Va., proved to a lot of "Doubting Thomases" that a B-17 engine could be changed (without any special preparation or warning) between 4:00 o'clock, afternoon, and 6:00 o'clock the following morning.

TRYING MOMENTS DURING A WEATHER FLIGHT
By the Kelly Field Correspondent



THE following comprises a report of Captain B.M.Hovey, Jr., pilot of the Meteorological Flight on November 1, 1937:

The weather flight at Kelly Field on the morning of November 1st was an interesting experience to the pilot, but a trying one to the personnel at Kelly Field who were connected with the flight.

Captain Hovey departed from Kelly Field at 1:10 a.m., in an O-25 airplane, equipped with the weather instruments. Although the ceiling had been unlimited, it was obvious that a fog was forming at an approximate altitude of 800 feet. However, after consulting the personnel of the Weather Section who are on duty twenty-four hours of the day, the pilot decided that he should attempt the flight.

Captain Hovey instructed the Weather Section to keep him posted on any changes and the base altitude of the fog which they were observing at five-minute intervals. At an altitude of 850 feet, the pilot was obliged to take to his instruments for about 200 feet, the top of the fog being about 1100 feet. The climb from the ground was made at 300 feet a minute. Radio contact with the ground station at Kelly Field had been established before take-off and a report of the altitude of ceiling was made. Above the fog, which was still pierced with holes through which lights on the ground could be seen, Captain Hovey decided to fly toward Corpus Christi above the light line, since the general visibility in that direction was better than in any other. Just as an altitude of 14,000 feet was reached, a ceiling of 600 feet was reported from Kelly, so the pilot started for the ground. The correct pressure altitude was set on the altimeter and the plane leveled off at 200 feet about 20 miles southeast of San Antonio. A course was then flown parallel to the light line toward Kelly.

After about three minutes on this course at this low altitude a zero ceiling was encountered, forcing the pilot to climb above the fog which was now 1,000 feet thick. The pilot had no trouble flying in over Kelly on the east leg of the Kelly Field beam. After passing through the cone of silence, a power glide was established and a continued left turn flown so that the plane would be brought out of the fog at or very near the station. When an altitude of 500 feet was reached, the radio announced that the flood and boundary lights had gone out at Kelly. This was sad news, since the pilot had been relying upon the glare from the flood lights to determine when the plane was below the fog. A rapid glance from the instruments over the cockpit revealed nothing but fog, so the pilot again climbed back up on top.

Repeated attempts were made to come down through the fog, but the bottom could not be found as low as 300 feet. A course was set for Corpus Christi again, and Captain Hovey told the Kelly radio operator, at 3:06 a.m., that he would land at Pawnee at the Department of Commerce emergency field if it was in the clear. The fog was very thin over this field, so a landing was made there without difficulty at 3:40 a.m.

Pawnee is but sixty miles from Kelly Field, but was out of range of the transmitter of the O-25, so no report could be made to the home station that a safe landing had been accomplished. Shortly after landing at Pawnee, the fog rolled in there. Ceiling and visibility remained zero at both Pawnee and San Antonio throughout the remainder of the night. The pilot took short naps in the cockpit, on the wing, and under the wing on the ground. Fifteen minutes after dawn, the pilot found a sleepy rattlesnake about fifteen feet from the left wing of the plane, so he spent the rest of his time in the cockpit.

The gasoline carried was sufficient for about five hours; therefore, by 6:00 a.m., he must have been down some place. Anxious minutes passed with no report, so an organized aerial search was planned and, shortly after the first planes departed to search south of Kelly Field toward Pawnee, a radio message was received from Captain Hovey that he was enroute to Kelly Field, where he arrived at 9:05 a.m.

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The British Air Ministry recently issued the following warning to pilots of the Royal Air Force:

1. During experimental flights undertaken for the purpose of testing de-icing equipment, it has been found that the lateral control of an aircraft may be jammed temporarily.

2. In each case this has happened when the aircraft entered a region in which the temperature of the atmosphere was about 0 deg.C., after having flown for some time in very severe icing conditions. At this temperature the ice on the leading edges of the planes and ailerons was melting and breaking away. It is thought that some of this loose ice found its way into the gap in front of the balance portion of the aileron and restricted its movement.

3. The first indication of this condition has been a sharp snatch laterally on the control column which may move the co

(Continued on page 14).

74TH SQUADRON CONSTRUCTS GUNNERY RANGE

By 1st Lieut. Franklin K. Paul, Air Reserve

SIXTY miles southwest of Albrook Field in the lowlands of the mountainous spine that splits the Isthmus of Panama lies the Army flying field and gunnery range at Rio Hato. A permanent detail of eight men is utilized at this field to set up targets, service airplanes, and maintain the radio station that answers (usually) to the phonetic, Roger Hypo Seven.

With the advent of the A-17 airplanes, and the conversion of the 74th Pursuit-Bombardment-Attack Squadron, it became necessary to construct an elaborate and entirely different arrangement of gunnery and bombing targets. Accordingly, on the morning of October 18th, some 25 men of the 74th Squadron, armed with hammers and nails, picks, shovels and field camping equipment, clambered aboard two Federals full of two by four lumber and set out for Rio Hato and ten days of work. Trucking to Rio Hato was no mean feat in itself, as it entailed sidestepping the scores of chiva drivers who demand seven eights of the narrow gauge road and yield the remaining eighth as a grudging favor. However, men and lumber reached camp without losing a board foot.

Setting up camp and clearing the area of trees and brush began, the officers of the 74th taking charge of the camp in two-day shifts. Work was usually halted at noon and the remainder of the day devoted to swimming at nearby La Venta beach, or lying on bunks - a small amount of swimming and a great amount of lying. Rumors of sharks seen cutting the water around the point added the spice of excitement to those who sought relief from the afternoon heat in the surf. Sleeping conditions in the cool tropical nights were excellent and, although the rainy season was in full swing, the only tent that leaked appreciably was that occupied by the officer in charge. Even this discomfort was surmounted by the simple expedient of shifting the bunk to various positions, although the splashing of rain on the floor was a constant reminder that nature was very very close.

The main feature of the construction work, aside from laying out bombing circles and foul lines, consisted of erecting ten wooden targets in column, each target fifty feet long and approximately three feet high, with a space of fifty yards between targets. A survey and a line of levels for the layout were run with difficulty due to recalcitrant vertical circle and a bubble tube that refused to associate with the line of collimation; but the final error was whittled down to one sixteenth of an inch. Each fifty-foot panel was constructed in five movable sections, faced with solid board and painted white. Future air travelers, spying the white panels from above, will probably wonder idly why such an elaborate four-foot hurdle race outfit was set up so far from civilization.

Work on the targets was completed and the men returned to Albrook Field on the 27th. The 74th Squadron has tentatively arranged to encamp again at Rio Hato sometime during November to engage in a short gunnery and bombing season, using the newly constructed range. Scorekeepers, snuggled safely in dugouts close to the line of fire, will listen to the whispering rush of A-17's close overhead, will hear the smack of bullets in the wooden face boards, and will probably visualize the things that will happen to an unwary column of troops in any future conflict.

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SPECIAL NOTICE

I desire to invite the attention of Air Corps officers to the Command and General Staff School Quarterly, a military periodical, the sole aim of which is to serve as a reliable professional medium enabling officers to keep abreast of military development the world over.

Among the features of the "Quarterly" are -

Selected historical problems illustrating current tactical teachings.

A section devoted to "Military News Around the World."

Carefully selected lectures, problems and texts illustrating or effecting the procedure or tactical doctrines of the Command and General Staff School;

Reviews of foreign and domestic military books and periodicals.

General Bundel, Commandant of the Command and General Staff School, says:

> "Every officer who desires to keep abreast of his profession should, in my opinion, be a subscriber to the Command and General Staff School Quarterly."

With this sentiment I heartily agree.

The yearly subscription cost is $1.00 for the four issues.

O. WESTOVER,
Major General, Air Corps,
Chief of the Air Corps.

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A series of tests recently completed at the Materiel Division, Wright Field, Ohio, to determine the most effective method of providing clear vision through airplane windshields, favored the rotating wiper blade, in combination with a heated windshield.

V-7566, A.C.

HALF A PROPELLER SHOWS TO ADVANTAGE

"HALF a loaf is better than none" is a time-worn expression, but the fact that half of some material thing can be better than a whole one in some instances is something which has been established in at least one line of endeavor - aviation.

It appears that, as a result of a recent development in propeller research activities, the conclusion may be drawn that half a propeller is better than a whole one. In the November 15th issue of THE SPORTSMAN PILOT, Mr. Arthur S. Pierce contributes an article of unusual interest on the subject of the Cropped Prop. Mr. Pierce goes on to say:

"A year ago the idea of flying an airplane with a single-blade, or half propeller, could scarcely have been advanced as a serious topic of conversation. Today, thanks to Walter W. Everts, Baltimore inventor, any discussion of the single-blade revolves around the principles of this innovation, or to put it simply: 'How in Tophet does the darn thing work?'

Last March I undertook to make a test of the sensational (at that time) single-blade propeller from Pennsylvania to the Pacific Coast. The single-blade had been first brought to public notice when an early model was flown to and exhibited at the National Aviation Show in New York City last winter. This model is now in the Smithsonian Institution.

Everts, or rather the Everel Propeller Corporation, agreed to equip a Cub with the single-blade for a flight to the Pacific Aircraft Show in Los Angeles. At Lancaster, Pennsylvania, we installed and tested the experimental model for the flight. Mr. Everts explained the principles of the device to me at much length and I hopped off, blithely confident that I knew the why and wherefor of the device swinging around the propeller shaft.

At the first stop in Pittsburgh I was able to confound the bystanders with a 'simple' explanation of the single-blade. After more pondering and after additional observation of the airspeed and tachometer for two more hours in the air, I began to elaborate on my theories. That night I slept in Chicago, and on the following morning I found that my simple explanation of the propeller had undergone considerable change. In fact, I couldn't understand my own explanation.

So it went. I demonstrated and explained at airports every hundred miles or so and each night I had the story down pat. And every morning I had to study the puzzle of my own devising. The propeller worked beautifully even though it was still in the experimental stage. According to my calculations, the Cub was cruising nearly ten miles an hour faster than usual in cross, head and countering winds. This gave me just that much less time to study its operation.

Today, after more study, I believe I can explain the single-blade propeller in a simpler manner. Walter Everts assures me that my explanation is technically correct.

The design of the single-blade propeller began in Everts' laboratory in Baltimore. Experiments with propeller models indicated to him that a single blade produced greater thrust than the conventional design. Try as he would Walter was unable to get results with various combinations of multiple blades that would equal the single-blade.

It had been shown in experiments - and Everts checked these previous findings - that an air stream smooths out to practically normal flow in one revolution of a blade. Thus, as a propeller blade passes a fixed point a great acceleration of the air stream takes place. Before the blade makes a complete revolution, the air stream reverts to approximately normal flow, allowing the blade to 'attack' smoothly flowing air at all times.

In Lancaster I witnessed an experiment designed to demonstrate this theory. A two-blade propeller for 40-horsepower motors was turned on a test block at rated top speed throwing a smoke stream. The smoke stream described a spiral.

A single-blade designed for 40-horsepower motors was then mounted on the test block and turned at its rated top speed. The smoke stream in this case traveled in almost exact straight lines with no spiraling effect.

After hundreds of experiments, Everts completed the design for a practical single-blade that promised to produce at least 25 per cent greater thrust than conventional two-blade propellers. In short, nearly sixty experimental full-sized blades and more than a dozen hubs and mechanisms were built and tested before 40-horsepower model of the single-blade was submitted for an Approved Type Certificate, which was received.

To begin with, the 'stub' and the 'blade' balance. The Center of Gravity of the stub and the Center of Gravity of the blade balance on the crankshaft in the same manner as a conventional propeller. A counter-weight in the stub compensates for the difference in weight between the blade and the short stub.

The counter-weight in the stub of the Everel is attached to the hub by a tube of nickel steel, eliminating any strain on the wood fibre around the hub. Balancing is accomplished by screwing this counter-weight forward or back on the steel shaft. An adjustment of hair fineness is possible.

The mechanism of the hub allows the

propeller to swing forward or back at will. Under the thrust, or air load, on the blade, the tip is inclined forward, while centrifugal force tends to carry the blade backwards towards a position at right angles to the crankshaft. In operation, a balance is achieved between these two forces.

This movement reduces any bending moments of the blade. The free fore-and-aft movement also reduces vibration and the transmission of gyroscopic forces to the airplane, and practically eliminates side strain on the crankshaft.

Engineers of the Everel company tell me there is practically no vibration period in the single-blade and that tests up to 5,000 revolutions per minute have verified this calculation. This is borne out by tests with a Vibrometer.

At Lancaster I also witnessed a demonstration of this finding. A model single-blade, about 20 inches long with fixed pitch, pivoted in the fore-and-aft direction, was revolved approximately 1,800 r.p.m.'s on a flexible shaft. To the eye there was no vibration of this shaft and the supporting bearing could be held in the hand without any feeling of vibration.

Now we come to the constant pitch, or variable pitch action of the single-blade. With the airplane held stationary at the blocks and the motor turning over at top speed, it is apparent from the foregoing that the blade will incline forward under the air load.

As the blade swings forward it also pivots to the lowest blade angle of attack, or low pitch. This, of course, is the angle which is most desirable for take-off and climb. The fore-and-aft movement and the pivoting action of the single-blade are accomplished on a single bearing.

When the airplane is released from the blocks and moves forward, the blade swings backward, under centrifugal force, toward the position at right angles to the crankshaft. As the blade swings backwards it also pivots to a higher angle of attack or pitch.

Between the points of high and low pitch, we always have a balance between centrifugal force and the air load, or thrust on the blade. This balance causes the blade to take the best pitch for the speed of the airplane. In addition, the variation in pitch under this balance is regulated by the condition of the atmosphere; that is, thin air or heavy air affect the pitch of the blade, causing an increase or reduction in the angle of attack.

On the trip to the West Coast, I was furnished with a concrete example of this atmospheric effect on the single-blade between Columbus, New Mexico, and Tucson, Arizona. It was necessary to reach 9,000 feet over sea level on this hop to clear mountains. At 8,000 feet, the revolutions per minute of the propeller began to slow down, proving two things. First, that the pitch angle of the propeller was increasing because of thin air and a decreased air load on the blade. Second, that the ceiling of that particular throttle setting had been reached.

Usually when the thin air effect begins to be apparent, it is manifested by increased revolutions per minute or racing of the propeller because of the lessened resistance of thin air and a lean mixture of the carburetor. By opening the throttle a trifle, it was comparatively easy to pull over the high terrain.

Summing up, the single-blade swings forward, taking the low pitch angle for take-off and climb; it swings backward as speed is increased, taking the best angle for speed and atmospheric conditions.

The single-blade is not limited to low horsepower planes. In designing the single-blade for commercial use, Everts and his engineers have had to discard all propeller theory and tables based on multiple blades and set up entirely new tables for the single-blade.

In other words, they have gone back thirty years and started from scratch in propeller design. The camber and chord of a single-blade propeller are different from conventional designs. Obviously it is more sensible to work out these designs on a 40-horsepower motor than on a 1,000-horsepower motor. But the principle is exactly the same, and while preparing models from 40 horsepower for sale, Everts and his staff are also well under way in calibrating single-blade tables up to 1,500 horsepower."

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Jamming of Ailerons by Ice

(Continued from Page 11).

trol column by as much as a fifth of its normal full movement. In every case it has been possible to free the ailerons by moving the control column further in the direction caused by the snatch, thus allowing the ice to clear, before resuming normal control. It is considered that any attempt to force the control column back to its normal position before clearing the ice may result in locking the ailerons, and the loss of lateral control.

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H E L P W A N T E D

Correspondents to write about the Air Corps activities at Selfridge Field, Randolph Field, Scott Field and Wheeler Field. Haven't had the pleasure of hearing from these stations for some time. What's going on out there?

V-7566, A.C.

WAR SECRETARY SAYS AIR CORPS MUST BE READY

In his annual report to the President for the year 1937, the Hon. Harry H. Woodring, Secretary of War, among various other recommendations affecting the military establishment, advocates an increased strength for the Air Corps both in personnel and materiel. Touching on the present situation confronting the Air Corps, he states that the utilization of larger and more complicated types of aircraft have necessitated an increase in the number of officers assigned to that branch, and he adds that, unless more officers are authorized for the Army as a whole, an increase in the number assigned to the Air Corps can only be made at the expense of other branches which are already feeling keenly the shortage in commissioned personnel. The enlisted strength of the Regular Army, he asserts, should be recruited up to authorized strength of 165,000 and maintained at that strength during the next year. Additional enlisted men are required principally in the Air Corps and to fill anri-aircraft regiments of the Coast Artillery Corps.

With respect to the Reserve Corps, the Secretary of War states that at least 30,000 Reserve officers should be given two weeks' active duty training each year, this number being in addition to those on extended active duty with the Regular Army and the Civilian Conservation Corps.

Declaring that the most noticeable recent advances have been in aircraft, Mr. Woodring states:

"We now have on hand approximately 1,000 new military airplanes, nearly all of them less than 3 years old, and another 1,000 are under order. In addition, we have on hand several hundred serviceable planes, classified as obsolete. These older planes will all be replaced within the next year or two.

"Our goal in airplane strength is 2,320 modern, serviceable planes, to be attained not later than June 30, 1940. This number was recommended as highly desirable by the Baker Board 3 years ago. Subsequent studies have confirmed the conclusions of the Baker Board with respect to this number. Recent aviation developments have produced military airplanes of much greater speeds, with much greater range, and much more effective than any visualized 3 years ago. Hence, an air fleet of 2,320 planes today is several times more powerful than one of a comparable numerical strength a few years ago.

"Foreign countries are making heavy increases in the strength of their air arms and most of the first-class powers have many more airplanes on hand or under construction than we have. However, in quality our new planes are at least the equal and probably the superior, type for type, of any military airplanes in the world. Our program of airplane procurement does not contemplate attaining the numbers possessed by other countries. With our favorable geographic position and our determination to use our military strength only for defensive purposes, we believe that 2,320 military airplanes will be sufficient for our needs. If funds are made available we hope to attain this number by 1940. Thereafter, it will be necessary to procure approximately 500 new airplanes each year to replace obsolete and unserviceable craft and to keep our equipment abreast of current developments.

"It should be borne in mind that modern aircraft cannot be quickly improvised. The construction of airplanes necessarily takes considerable time. Hence, our peacetime strength should approximate rather closely our requirements in war. Furthermore, in a major war our air arm would probably be engaged almost immediately on the opening of hostilities. Therefore, it is desirable that it be practically on a war footing in time of peace.

"While we are procuring up-to-the-minute aircraft in sufficient quantities to bring our air strength gradually up to our requirements, we are at the same time encouraging the experimental development of new types so that we may continually improve the quality of our equipment. In this way we guard against overstandardization of airplanes and we are able to take advantage of technical improvements as rapidly as they are developed. * * *

"The program of modernizing the equipment of all components of the Army should be accelerated in order that we may quickly improve and expand such organizations as the Air Corps, the antiaircraft artillery, and seacoast defenses. * * "

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Due to the necessity of transporting power plants by air, it has been the aim of the Materiel Division at Wright Field to develop the lightest weight unit possible. The standard C-1 portable electric power plant, gasoline driven, of 110 volt, 2500 watt capacity, weighs 320 pounds. Recent developments have resulted in a design of power plant with the same capacity as the Type C-1, but weighing only 160 pounds, which is a considerable weight saving over the Type C-1. In the new power plants the generator and engine are integral with each other, all castings are of aluminum, and the engine is of two cycle design. The power plant is mounted on wheels, which are removable for transportation, and the overall dimentions are less than those of the standard Type C-1 power plant.

THE "COL. HORACE M. HICKAM" CHRYSANTHEMUM

It seems that the memory of the late beloved Colonel Horace M. Hickam is being perpetuated in more ways than one. Readers of the News Letter are aware of the fact that a large flying field in Hawaii now in process of construction has been named in honor of the deceased Air Corps officer. It has been brought to our attention that, at a recent exhibit of Fall flowers in Washington by the U.S. Department of Agriculture, a variety of chrysanthemum which attracted considerable attention bore the designation of "Colonel Horace M. Hickam."

It has since been learned that this variety of chrysanthemum originated in the greenhouses of Mr. Tom Knipe, a florist of Kokomo, Indiana, whose wife is the sister of Colonel Hickam. Mr. Knipe states that this variety showed such high quality of bloom and such large size that both he and Mrs. Knipe deemed it worthy of a very fine name, and therefore they named it in memory of Colonel Hickam.

This variety of chrysanthemum was exhibited in the National Chrysanthemum Show in Detroit in 1935, and won the silver medal of the Society of American Florists for the best new seedling chrysanthemum in the show. It was also awarded the first prize in the same Show for the best twelve yellow chrysanthemums exhibited. It matures about the middle of November and should be bloomed on a terminal bud. It is a very large golden yellow exhibition variety, and Mr. Knipe, who is Vice President of the Chrysanthemum Society of America, believes it is superior in size and quality of bloom to any other yellow exhibition variety at present on the market.

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BOUQUETS FOR THE B-17

The Second Bombardment Group, declares the Langley Field Correspondent, will always remember 1937 as the year in which they received the B-17 airplane and entered a most interesting phase of training, missions based on greater range and higher speeds than ever before.

The first few months were devoted to transition and making necessary minor changes for improvement or safety in the airplane. The next three months were devoted mainly to performance flights to obtain the true performance of this plane at all altitudes, speeds and wing loading.

The last period is being entered now, one devoted to navigation, bombing and gunnery. Not only is there the usual navigation school conducted on the post, but each squadron has its own school, conducted by an experienced navigator, who instructs the other members of the B-17 crews in the fundamentals of navigation.

Protection from wind blast, coupled with ease of manipulation and a stable platform from which to fire, has encouraged gunnery tremendously, as is evidenced by the expenditures of 30 calibre ammunition this year. Marksmanship has improved correspondingly.

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FAST GOING IN SUBSTRATOSPHERE PLANE.

Officers stationed at the Air Corps Materiel Division, Wright Field, namely, Captains A.H. Johnson and T.A. Sims, Air Corps, pilots, with Major F.F. Reed, Ordnance Department, and Captain H.G. Armstrong, Medical Corps, as passengers, accomplished an exceedingly fast flight in the Army Air Corps substratosphere airplane on November 2nd. Taking off from Chicago, they passed over Chanute Field at an altitude of 19,000 feet. At this point they started timing the flight and proceeded to Wright Field. An altitude of from 19,000 to 21,000 feet was maintained over this course, and the distance of 220 miles was covered in 38 minutes. This averages close to 350 miles per hour. With the substratosphere airplane no oxygen equipment or heavy clothing were necessary at the highest altitudes, due to the supercharged cabin feature.

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AIR CORPS OFFICERS AS LECTURERS

Among the Wright Field officers who are rendering the Air Corps a special service through lectures on Air Corps activities are Captain T.A. Sims, who talked before the Rotary Club of Piqua, Ohio, on November 9th; Lieut. H.H. Tellman, who lectured before the University of Dayton on November 10th; Lieut. E.S. Perrin, who lectured before Miami University, Oxford, Ohio, November 11th; and Captain A.H. Johnson, who lectured before the Gyro Club of Cincinnati, Ohio, on November 11th.

Scheduled for lectures in the near future are: Lieut. H.M. McCoy, who will talk before the Lion's Club of Hamilton, Ohio, on December 1st, and Lieut. L.E. Massie, who will talk before the Society of Military Engineers and Reserve Officers at Cincinnati on December 8th.

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The 21st Reconnaissance Squadron at Langley Field, Va., has only recently been equipped with the B-18 type airplanes which are proving, in the main, satisfactory for reconnaissance missions. All the personnel of the outfit are enthusiastic about them, which augurs well for the missions the Squadron may draw in the future from Brigadier General Gerald C. Brant, Commander of the Second Wing.

V-7566, A.C.

USE OF RADIO AS AN AID TO NAVIGATION

After several experiences in locating the cone of silence and letting down through solid overcast in actual bad flying weather, and feeling convinced that there was a need for a compendium of best methods and procedure in such cases, in view of the fact that there seems to be little information on the subject available in written form, Lieut. Colonel Junius W. Jones, Air Corps, Commanding Officer of Chanute Field, Rantoul, Ill., directed Captain Hugo P. Rush, of that station, to prepare some notes on this subject, and which are quoted hereinafter. Certain points discussed in these notes are quite controversial in character. While the opinions expressed are those of an individual who has had considerable experience in the use of radio aids to air navigation, they are not necessarily to be construed as officially accepted and recognized methods.

The notes prepared by Captain Rush are as follows:

1. When heading for a station try to get on a leg of the radio range at least 15 minutes before estimated time of arrival for the following reasons.

a. It offers time to get accurately a line in the Twilight Zone which will frequently save working an orientation problem.

b. By obtaining a compass reading necessary to remain in the Twilight Zone which is valuable in case the station starts a broadcast.

2. When approaching a station maneuver constantly between the Twilight Zone and the Oncourse Signal. When in a Twilight Zone head for the Oncourse Signal and when receiving an Oncourse Signal head for the Twilight Zone. This assists in accurately obtaining a heading of the radio range leg, and in a measure indicates the distance from the station by the rapidity that changes in heading are necessary.

3. Always be sure that you are flying with the volume control on manual. If necessary to use automatic, keep in the Twilight Zone to facilitate location of the radio range.

4. If static is bad, or signal strength varies, clearly keep in the Twilight Zone.

5. Check reliability of radio reception by tuning in on stations while at a considerable distance from a station.

6. The cone of silence or the station can frequently be located more easily or more positively at medium altitudes of 1500 to 3000 feet than by flying at extremely high altitudes because the build-up and fading after passing a station is much more rapid.

7. Upon approaching a station, keep volume turned down to the point where the signals are just audible. It is of some assistance to turn the volume extremely slowly, as when approaching stations it will require almost constant turning of the volume control in order to keep the signal strength down.

8. When maneuvering near the station and making 270 degree turns, turn away from the station rather than towards it.

9. If time for gasoline is of importance, circle during interruption of beam as it usually saves time in the long run.

10. Look upon every range or combination of ranges with suspicion and for the best approach, as usually one is much easier than the other. Plan circling pattern for loss of altitudes, listing altitudes and courses and times before reaching the station.

11. Read altimeter each time, starting from small hand to a large hand, for instance: 1,700 rather than glancing at the hand which indicates 700. This will assist in avoiding errors of an even 1,000 feet. Establish a minimum altitude before reaching the station, usually field altitude plus 3 or 400 feet, depending upon location of obstacles.

Cone of Silence:

Perhaps too much emphasis has been placed on locating the cone of silence and insufficient emphasis placed on the maneuvering pattern for arriving over the field at minimum altitude. Upon locating the cone of silence, maneuvering should begin at once on a predetermined plan and the changes of signal from one course to various sectors. At least three changes should be used to definitely determine that the cone of silence was true and not false.

13. Circling during interruption of beam can be avoided if the leg of the beam has been accurately lined up. This can be accomplished by turning at least 10 degrees to the right until the beam is again placed in operation. If the station has been passed during the broadcast, it will become immediately apparent, due to the complete change in signal.

14. If there is no change of signal when redeiving the beam other than to indicate to move further into an A or N Zone, head back to the radio range the same amount. This maneuver will assist in eliminating any possibility of passing from one side of the radio range to the other side of the radio range where the same signal would be received.

In transmitting these notes to the Information Division, Colonel Jones states that, while there are one or two points therein in which he does not fully concur, he believes they are a step in the right direction and that they should serve as a starter upon which to build something in the nature of an Instrument Flying Manual.

(Continued on Page 18).

OSCILLATING BEACON

Results of service test of a new type of beacon, known as the oscillating beacon, have recently been received at the Materiel Division, Wright Field, O.

The optical arrangement of this beacon consists of a 360° Fresnel lens with axis of symmetry placed vertically. The light source, a 1500-watt, 32-volt lamp with special barrel type filament, is so designed that it is periodically raised and lowered from the focus, the motion being along the axis. The resulting beam, which is transmitted 360° radially, sweeps from the horizontal upward to approximately 8° above the horizon, and then downward to the horizontal. The lamp operates at approximately 40 strokes per minute. The signal transmitted to the observing pilot is normally 80 flashes per minute as compared to 6 flashes obtained with the conventional rotating beacon.

Other advantages of this beacon are as follows:

a. The time interval between flashes is small.

b. The effect is independent of altitude.

c. The beacon is especially effective during bad weather, when needed the most.

During the service test of this beacon at Mitchel and Selfridge Fields, practically unanimous approval for standardization was given by all pilots who observed it. Action has been initiated to standardize the same, and it is contemplated that all major stations will ultimately be supplied with this equipment.

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AERIAL PHOTOGRAPHIC TESTS

Captain C.W. O'Connor, Air Corps; Captain L.J. Rumaggi and Lieut. F.J. Dau, Corps of Engineers, recently took off from Wright Field, Dayton, Ohio, for Fort Sill, Okla., in a B-10B airplane which had been specially modified for flying new experimental types of Air Corps cameras. Their mission was to obtain photographs of the areas immediately contiguous to Fort Sill, for use by personnel of the Corps of Engineers at the Materiel Division for the preparation of Fire Control Data Sheets of the Fort Sill, Area. On this mission, which was covered in nearly a week's time, two cameras were used, the tandem T-3A (5 lens) and the experimental 4-inch wide angle type. Three flights were made at 20,000 feet, and personnel worked at that altitude some eight hours during the week.

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During the month of October, the Engineering Department of the San Antonio Air Depot overhauled 17 airplanes and 66 engines, and repaired 42 airplanes and 17 engines.

COLONEL McCHORD'S MEMORY HONORED

The new Northwest Army air base at Tacoma, Washington, has been designated "McChord Field," in honor of the late Colonel William C. McChord, Air Corps, who was killed in an airplane accident near Maidens, Virginia, on August 16, 1937. The announcement was made in War Department General Orders issued recently. The War Department policy is to name Air Corps fields and stations in honor of flying officers of the Air Corps Regular Army, or of the Air Corps Reserve, who have died in line of duty and who have had long, loyal and exemplary service.

Colonel McChord had been affiliated with military aviation since the World War. Previous to that time he served with the Cavalry, in which branch he was commissioned a second lieutenant on June 14, 1907, following his graduation from the United States Military Academy.

Colonel McChord was a graduate of the Mounted Service School, Fort Riley, Kans. the Air Corps Tactical School, Langley Field, Va.; the Command and General Staff School, Fort Leavenworth, Kansas, and the Army War College, Fort Humphreys, D.C. He served as Commanding Officer of Park Field, Millington, Tenn.; Gerstner Field, Lake Charles, La.; Chanute Field, Ill.; as Air Officer of the 6th Corps Area, and as Commanding Officer of the 19th Composite Wing, Panama Canal Department. Upon the completion of his foreign service duty in 1935, he was assigned to duty in the Office of the Chief of the Air Corps, and at the time of his death was Chief of the Training and Operations Division of that office.

McChord Field has an area of 1310 acres. The area selected for the site comprises the Pierce County Airport (also known as the Tacoma Airport), consisting of approximately 960 acres, and was donated to the Government through the Board of County Commissioners of Pierce County, Washington. The Congress recently authorized the purchase of an additional 350 acres to be included in the area occupied by the air base.

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Use of Radio as an aid to Navigation

(Continued from Page 17)

Referring to par.6 of these notes, Col. Jones states he has not found it easier to locate the cone of silence between 1,500 and 3,000 feet than at a higher altitude, his experience being that the higher the altitude the wider the cone of silence and the more pronounced the fading. As to maneuvering after locating the cone of silence, he declares his experience is that the best procedure is to fly in one straight line, say, 5 minutes, to one side of the cone of silence; then turn 180 degrees and fly back 10 minutes, putting you 5 minutes on the other side of the cone of silence, timing your location of altitude so as to be approximate over the cone of silence when you break through.

CLASSES AT AIR CORPS TECHNICAL SCHOOL

With the Maintenance-Engineering, Communications and Photographic classes well under way, academic activities at the Air Corps Technical School at Chanute Field, Rantoul, Ill., are fairly humming.

Among the student officers in this year's classes are one Marine Corps officer and one officer from the Philippine Constabulary.

The following is a roster of the student officers:

Maintenance Engineering: 1st Lieuts. Clayton E. Hughes, Thetus C. Odom, Carl F. Demberg, Frank G. Jamison, Charles B. Dougher, Richard M. Montgomery, 2nd Lieuts. Byron E. Brugge, Jack E. Shuck, Charles B. Harvin, Lawrence S. Fulwider, Burton W. Armstrong, Jr., Air Corps, and Captain Zebulon C. Hopkins, Marine Corps.

Communications: 1st Lieuts. William R. Morgan, James McK. Thompson, George F. Hartman, Edward J. Hale, Travis M. Hetherington, Vernon C. Smith, Samuel A. Mundell, George B. Dany, John W. White and 2nd Lieut. Jasper N. Bell, Air Corps.

Photography: 1st Lieuts. Thomas R. Starratt, Jerald W. McCoy, Donald L. Hardy, 2nd Lieuts. Hilmer C. Nelson, Air Corps, and 3rd Lieut. Jesus A. Villamor, Philippine Army.

In addition to the above 28 officers, the school rosters list the following number of enlisted students:

Department of Mechanics	178
Department of Armament	63
Department of Photography	63
Department of Communications	148
Department of Clerical Instruction	19

During the present year, it is expected that over 1200 enlisted students will be graduated and sent to service organizations.

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TESTS ON NEW MOTORIZED BALLOON COMPLETED

The War Department recently announced the completion of the initial phase of experimental tests on the C-6 motorized observation balloon at Fort Sill, Oklahoma. These tests have been in progress since early September and several hundred flights have been made under a great variety of wind and weather conditions.

The C-6 brings many novel and interesting features to the observation balloon field. The war-time captive balloon, known as the "sausage," and which has remained practically unchanged to the present time, was moored by a cable to a winch. To move it over the terrain when changing its station for observation, it was necessary to "walk" it overland, where power lines, fences, trees and other obstacles made progress slow and difficult, or to pull it down, deflate, roll it up and move it by truck - also a time-consuming process. The C-6 has the advantage that it moves under its own power across country, while its winch moves by a motor; arriving at the proposed rendezvous or ascension site, the balloon lands and is attached to its winch. Thereafter it performs the normal functions as a captive balloon, affording a stationary platform at high elevation for directing artillery fire.

Another great advantage possessed by the C-6 lies in the fact that this new balloon is filled with helium, a non-inflammable and non-explosive gas, while the older type was hydrogen filled, making it much more vulnerable to attack and much more likely to be destroyed by storm or fire.

The C-6 Balloon is 107 feet long and 30 feet in diameter and contains 52,000 cubic feet of helium. The old type "sausage" it replaces was 95 feet long, 27 feet in diameter and contained 37,500 cubic feet of hydrogen. The new balloon is powered by a 90 horsepower Lambert motor, mounted in a detachable car, giving the craft a speed of 40 miles per hour.

Major Ira R. Koenig, Balloon Squadron Commander at Fort Sill, Okla., has charge of the tests, assisted by Major W.C. Farnum as operations and engineering officer, and Staff Sgt. Joseph F. McMurray as operations clerk. The balloon was delivered from the lighter-than-air depot at Scott Field, Belleville, Ill., and set up by Master Sergeant Joseph A. Bishop and Staff Sgt. Harrison C. Finley, both of long technical experience in lighter-than-air service at the Depot.

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INTERESTING FLIGHT BY CAPTAIN WITTKOP

An interesting flight in a B-17 Bombardment airplane was recently made by Captain Hilbert W. Wittkop, of the 96th Bombardment Squadron, Langley Field, Va., the take-off being at 5:00 a.m. for Maxwell Field, Ala., via Barksdale Field, La. A report of the flight follows:

Clouds were encountered at 2,500 feet shortly after take-off and flying conditions became worse with altitude. No breaks were discovered up to 7,000 feet, so altitude was lost to 2,000 feet in an attempt to get underneath the ceiling. Being still blind at 2,000 feet, the flight was continued on instruments.

Passed through rain at 8,000 feet and emerged into broken clouds at 6:40 a.m. Clear weather but considerable turbulent air prevailed, with strong NW and W winds. Descended to 4,000 ft. at 8:30 a.m., in an attempt to find more favorable winds. Definite check of position at Chattanooga indicated 150 m.p.h. ground speed.

Arrived over Barksdale Field at 11:00 a.m. Dropped 20 bombs in four approaches from 7,000 feet and departed for Maxwell at 12 noon. Landed there at 2:45 p.m., after an uneventful trip. The time required from Langley-Barksdale Maxwell Fields was 9 hours and 45 minutes.

From 3:45 to 5:15 p.m., the B-17 was inspected by delegations from the National Guard Convention. The B-17 was obviously the center of interest and members of the inspecting party appeared favorably impressed.

Taking off from Maxwell Field at 3:25 the following morning, an unlimited ceiling and favorable winds gave a ground speed in excess of 200 mph. Humorous is the thought that the ground speed was so high that it was necessary to throttle well back when leaving Spartanburg, S.C., so that Langley Field would not be reached before daylight. The landing at Langley Field was made at 7:15 a.m., time 3 hrs. 50 min.

OBITUARIES

Two Air Corps officers, 1st Lieut. Thomas C. Morgan and 2nd Lieut. Loyal C. Woods (Res.), stationed at Randolph Field, Texas, lost their lives in an attempted landing after dark on November 26th, in the vicinity of the CCC Camp at Greenwood, S.C. Lieut. Morgan was pilot of the BT-2C plane, and Lieut. Woods, passenger.

Lieut. Morgan, who was a West Point graduate, Class of June, 1932, was a native of South Carolina and was born on September 29, 1907. Following his graduation from the Military Academy, he was commissioned a second lieutenant of Infantry, and applied for flying training at the Air Corps Training Center. He graduated from the Primary Flying School, Randolph Field, June 30, 1933, and from the Advanced Flying School, Kelly Field, Texas, October 14, 1933, on which date he was rated as "Airplane Pilot."

Assigned to duty in the Hawaiian Department, he served with the 4th Observation Squadron at Luke Field. Upon the completion of his two-year tour of duty in Hawaii, he was transferred to Brooks Field, Texas, where he served for about 16 months, and was then transferred to Randolph Field.

Lieut. Woods had a rather varied career prior to his assignment to duty with the Air Corps. He was born at Green Isle, Minn., September 25, 1906. After attending the University of Washington, Seattle, for two years, and the Wilson Business College of that city for eight months, he took a two-year course at the University of Southern California. He specialized in mechanical and electrical engineering and gas chemistry.

In 1926, Lieut. Woods was in the employ of the Western Oxygen Company, and on week ends flew a "Jenny" which he personally owned. In the following year he was employed by the Western College of Aeronautics and was engaged in enrolling students and teaching the theory of flight. Thereafter for several months he was employed as an automobile mechanic for a motor car concern in Seattle, and then went to work for the Northwest Flying Club, enrolling students and teaching theory of flight, together with aircraft maintenance. He performed the rigging on the airplanes and kept the motors in repair.

In the spring of 1929, Lieut. Woods went to Alaska, where he assembled a JN4D airplane from its original crates and flew it for the next two years on passenger flights and student instruction. He had no assistance in assembling or rigging of this airplane or in servicing or maintaining it during the entire time he flew it. Returning to the States in 1930, he was employed for brief periods as an acetylene welder for a construction company and as a solicitor for an air transport concern. He then entered the employ of a California Dental Supply Company, and in his spare time kept up his flying at the Culver City Airport by instructing students and hauling passengers.

During his connection with commercial aviation, Lieut. Woods flew fifteen different types of commercial aircraft. Having completed subcourses in Theory of Flight, Aerial Navigation and Meteorology, and after satisfactorily completing a written examination in other required subjects, and demonstrating his proficiency as a pilot before a board of officers, he was appointed a second lieutenant in the Air Reserve on September 24, 1936, and given the rating of "Airplane Pilot" on the same date. In September, 1937, he was ordered to Randolph Field, Texas, for a special course of instruction.

On Monday, November 15th, while on an authorized Pursuit transition flight from Kelly Field, Flying Cadet Alfred J. Vapitell, Observation Section, Advanced Flying School, was killed when his Pursuit plane which he was flying struck the top of a tree four miles west of Boerne, Texas. The body of the Flying Cadet and the wreckage of his plane were found on Mr. C.C. McFarland's ranch. The remains of the late Flying Cadet Capitell were sent to Boston, Mass., accompanied by Flying Cadet Richard A. Ames. A Board was convened to investigate the cause of the crash.

The deceased Flying Cadet was a graduate of Notre Dame University of the class of 1935, and started his flying training last February at Randolph Field. Surviving are his parents, Mr. and Mrs. Alfred R. Capitell, of Belmont, Mass.

The sincere sympathy of the Air Corps is extended to the relatives and friends of the deceased airmen who died in the service of their country.

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SERVICE TEST OF Y1A-18 ATTACK AIRPLANES

Conclusion of the initial phases of the service test of the Air Corps' new twin-engined Attack airplane, the Y1A-18, at Barksdale Field, La., was recently announced.

This new type was designed and built by the Curtiss Airplane Company, Buffalo, N.Y., to fill a particular need often expressed in Army Attack circles for more speed, greater armament load, and higher performance combined with greater visibility for the combat crew. It has been undergoing secret tests in the 3rd Attack Group of the GHQ Air Force, where its maintenance characteristics, flying qualities and military utility are being compared with those of single-engine Attack planes and with the desired requirements.

All these features the manufacturer has endeavored to design into this new article. Its twin engines, added power and special design give it greatly improved visibility for the pilot, a very necessary requirement in view of the low altitude at which Attack planes do their military missions. Daily during the past two weeks, pilots of the 3rd Attack Group flew these new planes over the gunnery and bombing range, firing the machine guns and dropping bombs to test in hard-flight service every feature thereof.

W-7566 A.C.